Bellwether Magazine

Volume 1
Number 5 *Fall 1982*

Article 3

10-1-1982

The Study of Reproductive Problems

Bellwether
No. 5
Fall 1982

Bellwether is published quarterly by the School of Veterinary Medicine at the University of Pennsylvania, in cooperation with the University of Pennsylvania Publications Office.

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The Study of Reproductive Problems

Reproductive problems are common to purebred dogs, and, to some extent, to cats. They are costly and frustrating and may end a breeding program. Cures and remedies are few because information is scarce. "There is a great deal of basic research necessary to solve these problems," explained Vicki Meyers, V.M.D., instructor in genetics, pediatrics, and reproduction at the School of Veterinary Medicine of the University of Pennsylvania, "much work needs to be done, much more information needs to be collected."

To help breeders solve reproductive problems of their breeding stock, and to gather information, the section of medical genetics established a weekly clinic in genetics, pediatrics, and reproductive problems. Here, Dr. Meyers and others counsel dog and cat owners and, together with referring veterinarians, seek solutions to the puzzle of infertility and reproductive problems in the animals.

"Infertility can have many causes. We look at the animal, check its history, and review the breeding management. Often things can be straightened out by changing the latter. We approach reproductive problems in the same manner as it would be approached in human or large animal medicine." Breeding management is particularly important in dogs because bitches are fertile only for a brief period every six to ten months. "That problem does not exist in cats, who are very efficient breeders and cycle frequently," said Dr. Meyers. "Also cats are not as varied as dogs; you do not have the tremendous number of breeds." As a consequence few cats with reproductive problems are presented at the clinic. "We would like to see more to study them and to gather information."

Breeding management for dogs includes close monitoring of the heat cycle through vaginal smears to observe the cell changes which occur prior to estrus. "It's not difficult to prepare and read the slides: all it takes is some practice and a small microscope. It need not be a fancy one, it can be a children's microscope," she explained. Another aid in breeding dogs is artificial insemination. "The owner can handle that also. The equipment is easily available. I have been teaching breeders how to do it and hope that they in turn will show others. To do artificial insemination here takes too much time and, therefore, is quite costly."

Proper breeding management also requires that a bitch be bred several times over a period of days once the slides indicate that estrus is present. If natural breedings are not possible, then artificial inseminations should be done. The object is to get the animal in whelp. She recommends that vaginal slides be read throughout the heat cycle to establish the day of ovulation retrospectively and to predict the whelping date. Dr. Meyers stated that the change in breeding management in most cases resulted in litters. She did point out that even though breedings are done at the proper time, twenty to thirty percent of normal bitches do not whelp litters. Dogs, unlike people, do not abort early in pregnancy, instead, the fetuses are resorbed. "When we open the uterus we find resorption sites. We do not know why this occurs, most likely something was wrong with the fetus," she explained. Bitches sometimes abort later in pregnancy, usually due to infectious disease, such as brucella. Cats abort more frequently due to a herpes-type infection against which the animal can be protected through vaccination.

Slides are not the only monitoring devices utilized to eliminate reproductive problems. Some brood bitches are followed more closely through blood samples taken throughout the heat cycle and diestrus to determine hormonal values and to analyze these retrospectively. "We know, for example, that the blood progesterone level rises in a bitch in diestrus, whether she is in whelp or not," Dr. Meyers explained. "We also know that it drops two months after ovulation. We don't know though what causes the bitch to go into labor; the drop in progesterone alone does not initiate it." In one study of research, dogs' progesterone levels are not only measured through blood samples but also through samples taken directly from the ovaries and the uterus of the pregnant female. "We want to find out whether the ovaries alone produce the hormone or whether the placentas also make it."

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Additional information about normal hormonal values and their function is important to clinicians when they attempt to find the cause of a reproductive problem. For example, it has been shown that uterine infections are common after mismating shots given to bitches which were accidentally bred.

Most uterine infections though are caused by bacteria. "When a bitch is in season it is very possible for bacteria, which are normally present in the vaginal tract, to make their way into the uterus. It's just a matter of chance." Dr. Meyers explained that during the heat cycle the immune system of the bitch increases in efficiency and provides additional resistance against invading bacteria. In diestrus the uterine resistance decreases and the bacteria which entered the uterus can multiply undisturbed and cause infection, pyometra. It has been found that uterine cell changes occuring during diestrus, such as an increase in uterine glands, create an ideal environment for bacterial growth. It is postulated that older bitches are more susceptible as uterine gland changes can increase with each heat cycle. Pyometra often does not manifest itself for several weeks. Once symptoms are evident swift action has to be taken. In the past bitches with pyometra were spayed. Now such drastic treatment is no longer the only alternative.

Dr. Meyers and her colleagues have devised a regimen which eliminates infection and retains the breeding capacity of the animal. The treatment differs from others in that a uterine biopsy and culture are taken to identify the organism causing infection. "Doing a vaginal culture only will not provide the answer because there are so many bacteria there normally," she said. During the biopsy surgery the uterus is examined, and the ovaries are checked and palpated. These examinations enable the clinicians to make a definite diagnosis of infection and other problems and help to ascertain the extent of damage to the uterus. The data aid in finding out whether reproductive capacity can be restored in a severely damaged uterus.

Bitches are treated with small doses of prostaglandin F 2 alpha for three days. Dr. Meyers explained that the dosage for a bitch has to be carefully calculated because dogs are very sensitive to the drug. Cats are more tolerant and can be given higher doses. Prostaglandin F 2 alpha causes the uterus to contract and expel the purulent material. The veterinarians also measure plasma progesterone levels and white blood cell counts before, during, and after treatment. Since progesterone levels are normally high during diestrus when the disease appears, it is thought that a reduction in these levels may be helpful in preventing a relapse. It has been found that prostaglandin F 2 alpha can reduce progesterone production by the ovaries during late diestrus.

So far ten bitches have been treated at VHUP. The oldest was six years old, though treatment is usually reserved for the young hitches that a breeder wishes to retain for his program. A number of the treated animals have whelped normal litters; none has had to be spayed to date. The largest litter was by a mastiff which recently whelped fifteen puppies. Dr. Meyers successfully used the prostaglandin treatment for a cat with pyometra and she subsequently had kittens. Because chance invasion of bacteria is possible during each heat cycle, Dr. Meyers feels that bitches treated with the drug should be bred during the cycle following treatment.

The research and studies at the School not only deal with female infertility but also with male infertility. This is a frustrating problem. "Often we cannot find the reason for it," she explained. "The typical story goes something like this: the dog produced puppies and then suddenly ceased to produce. We find that there are very few sperm, and in most cases there is no history of disease." Extensive tests and examinations reveal no causes for the absence of sperm. Dr. Meyers feels that a testicular biopsy is important to rule out that infertility is caused by infection or autoimmune disease. She pointed out that infertility in some beagles is due to immune mediated orchitis and thyroiditis and that the tendency for it is inherited.

Low thyroid function, according to Dr. Meyers, presently has not been found to be a major cause of reproductive failure. "People find that the T4 is low, they supplement, but they also do other things, so who is to say whether results are due to the thyroid supplement alone," she said. "To get the picture as to whether the thyroid is functioning properly, a thyroid stimulation test has to be done. We have not found low thyroid function in the infertile dogs we have treated here." She added that women with low thyroid function conceive but frequently miscarry, but whether this occurs in bitches is not known. "There really is no clear picture of the effects of low thyroid hormone production on the reproduction of dogs."

Other hormones play a role in male reproduction and one researcher, Dr. Vicki Scheidt of the dermatology department, is collecting data about testosterone levels in males. She is trying to define the normal level of the hormone in male dogs, regardless of age and size, and is measuring the blood values of many dogs to obtain these vital data.

Dr. Meyers's work does not end when the bitch or cat is in whelp. Often she and her colleagues are called upon when problems develop during pregnancy or birth. Much of this is done by telephone. By working closely with referring veterinarians, Dr. Meyers and her colleagues help breeders realize the goal of a litter of healthy, lively puppies or kittens.

The mechanisms of reproduction and birth still pose many questions. Answers to these will only come through more research. Dr. Meyers sums it up this way: "The more we see, the more we learn, and the more we can help."

Symposium for Dog Owners and Breeders

The 13th annual symposium, Your Veterinarian and Your Dog, will be held on January 29, 1983, at the School of Veterinary Medicine, 3800 Spruce Street, Philadelphia.

The program and speakers are as follows:

"Cancer in Dogs," *Michael H. Goldschmidt*, M.Sc., B.V.M.S., M.R.C.V.S., assistant professor of Pathology; chief, Diagnostic Pathology.

"Inherited Skin Diseases," *Vicki Jo Scheidt*, D.V.M., instructor in Dermatology.

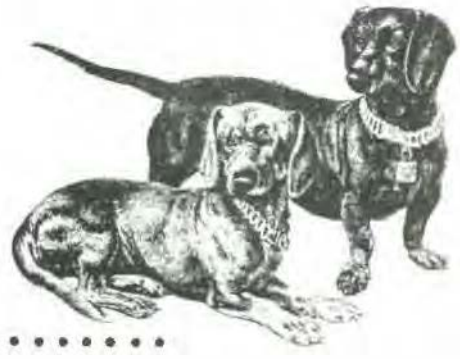
"Epilepsy, What Can We Do?," *George C. Farnbach*, V.M.D., Ph.D., assistant professor of Neurology.

"Some Inherited Enzyme Deficiency Diseases in the Dog and Cat," *Mark E. Haskins*, V.M.D., M.S., Ph.D., assistant professor of Pathology.

"New Developments in the Understanding of Inherited Metabolic Disease," *Peter F. Jezyk*, V.M.D., Ph.D., associate professor of Medical Genetics.

"Genetic and Non-genetic Disorders of Sexual Development in the Dog," *Donald F. Patterson*, D.V.M., Ph.D., Charlotte Newton Sheppard Professor of Medicine; chief, Section of Medical Genetics.

The cost of the all day program is $25 and this includes parking and a luncheon. Reservations for the symposium can be made by contacting M. Josephine Deubler, V.M.D., School of Veterinary Medicine, 3800 Spruce Street, Philadelphia, Pa. 19104.



The Cheever Porter Foundation

The Cheever Porter Foundation has made two grants of $10,000 each to the School of Veterinary Medicine. One is for the Mrs. Cheever Porter Internship in the Veterinary Hospital of the University of Pennsylvania (VHUP). The recipient of this internship for 1982-83 is Dr. Robert Washabau (V'82). The second grant known as the Mrs. Cheever Porter Fund for Veterinary Medical Genetics was made to support the research in the Section of Medical Genetics of which Dr. Donald F. Patterson is chief.